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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,914	03/15/2001	Roger Lee	M4065.0356/P356	2911

24998 7590 12/15/2003

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EXAMINER

TOLEDO, FERNANDO L

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 12/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/805,914	LEE, ROGER	
	Examiner	Art Unit	
	Fernando Toledo	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) 43-61 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>20030826</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 – 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. (U. S. patent 6,555,858 B1).

In re claims 1 and 21, Jones in the U. S. patent 6,555,858 B1; figures 1 – 15 and related text discloses forming several of spaced apart first conductive layers 228 over an insulating layer 218 over a substrate 200; forming several of spaced apart magnetic memory element stacks 240 over the several first conductive layers, wherein each of the magnetic memory element stacks is formed by the steps of forming a first magnetic layer 234 over a corresponding first conductive layer and forming a second magnetic layer 236 over the first magnetic layer the second magnetic layer having an associated top conductive layer 248; forming an insulating material 244 over and in between the spaced apart magnetic memory element stacks; and removing at least a portion of the insulating material over at least one of the memory element stacks to expose the top conductive layer of the at least one memory element stack (Figure 6).

3. In re claim 2, Jones discloses wherein the act of removing at least a portion of the insulating material further includes exposing an upper surface of the top conductive layer (Figure 6).

4. In re claims 3 and 22, Jones discloses further including forming a nonmagnetic layer 230 between the second magnetic layer and the first magnetic layer.
5. In re claim 4, Jones discloses wherein the insulating material is removed to expose an upper surface of several of top conductive layers associated with respective memory element stacks, the method further including forming several of second conductors 248 – 250 each in electrical connection with several of the exposed upper surfaces, the several of second conductors running substantially orthogonal to the several of first conductive layers (Figure 6).
6. In re claim 5, Jones discloses wherein the act of removing at least a portion of the insulating material further includes chemical mechanical polishing of the insulating material to expose an upper surface of the top conductive layer (Column 6, lines 12 – 32).
7. In re claim 6, Jones discloses wherein the top conductive layer is formed of a material selected from the group consisting of tungsten nitrogen, tungsten, gold, platinum and copper (Column 7, lines 34 – 50).
8. In re claim 7, Jones further explains wherein the insulating material is formed of a material selected from the group consisting of silicon nitride and oxides (Column 6, lines 60 – 64).
9. In re claim 8, Jones further shows wherein the insulating material is a high temperature polymer (Column 6, lines 60 – 64).
10. In re claim 9, Jones additionally discloses wherein the insulating material is a low dielectric constant inorganic material (Column 6, lines 60 – 64).
11. In re claim 10, Jones additionally shows wherein the insulating material is silicon nitride (Column 6, lines 60 – 64).

12. In re claims 11 and 33, Jones discloses wherein the act of forming the first magnetic layer further includes the step of forming a first several of stacked layers, the first several of stacked layers including at least one magnetic material layer (Column 4, Lines 46 – 55).
13. In re claim 12, Jones additionally explains wherein the magnetic material layer contains a material selected from the group consisting of tantalum, nickel-iron, tungsten-nitrogen, nickel, cobalt-nickel-iron, iron and manganese-iron (Column 4, Lines 46 – 55).
14. In re claim 13, Jones discloses wherein the first several of stacked layers includes layers of tantalum, nickel-iron and manganese-iron (Column 4, Lines 46 – 55).
15. In re claim 14, Jones teaches etching the first several of stacked layers to have a width, which coincides with the width of the first conductive layers (Figure 6).
16. In re claims 15 and 37, Jones discloses wherein the act of forming the second magnetic layer further includes forming a second several stacked layers, the second several stacked layers including at least one magnetic material layer and the conductive layer (Column 5, Lines 31 – 67).
17. In re claims 16 and 38, Jones discloses wherein the magnetic material layer includes a material selected from the group consisting of tantalum, nickel-iron, tungsten-nitrogen, nickel, cobalt-nickel-iron and manganese-iron (Column 5, Lines 31 – 67).
18. In re claims 17 and 39, Jones discloses wherein the several second stacked layers includes layers of tantalum, nickel-iron and tungsten nitrogen (Column 5, Lines 31 – 67).
19. In re claims 18 and 40, Jones discloses further including etching the several second stacked layers (Figure 5).

20. In re claims 19 and 41, Jones discloses wherein the first magnetic layer has a pinned magnetic orientation (Column 6, Lines 60 – 64).
21. In re claims 20 and 42, Jones discloses wherein the second magnetic layer has a free magnetic orientation (Column 5, Lines 31 – 67).
22. In re claim 23, Jones discloses wherein the nonmagnetic layer is formed of a material selected from the group consisting of aluminum oxide, titanium oxide, magnesium oxide, silicon oxide and aluminum nitride (Column 5, Lines 18 – 30).
23. In re claim 24, Jones discloses wherein the act of forming the insulating material further includes depositing the insulating material (Column 6, Lines 12 – 23).
24. In re claim 25, Jones further discloses wherein the act of removing a portion of the insulating material further includes chemical mechanical polishing (CMP) of the insulating material to expose the upper surface of the conductive layer (Column 6, Lines 12 – 23).
25. In re claim 26, Jones further teaches wherein the conductive layer is formed of a material selected from the group consisting of tungsten nitrogen, tungsten gold, platinum or copper (Column 7, Lines 34 – 50).
26. In re claim 27, Jones teaches wherein at least one of the top conductive layers is formed of tungsten nitride (Column 7, Lines 34 – 50).
27. In re claim 28, Jones teaches wherein at least one of the top conductive layers is formed of tungsten (Column 7, Lines 34 – 50).
28. In re claim 29, Jones further explains wherein the insulating material is formed of a material selected from the group consisting of silicon nitride and oxides (Column 6, Lines 60 – 64).

29. In re claim 30, Jones further shows wherein the insulating material is a high temperature polymer (Column 6, Lines 60 – 64).

30. In re claim 31, Jones additionally discloses wherein the insulating material is a low dielectric constant inorganic material (Column 6, Lines 60 – 64).

31. In re claim 32, Jones additionally shows wherein the insulating material is silicon nitride (Column 6, Lines 60 – 64).

Response to Arguments

32. Applicant's arguments filed 20 October 2003 have been fully considered but they are not persuasive for the following reasons.

Applicant contests that the Office Action mailed 23 July 2003 that layer 228 is not a magnetic memory stack but a conductive layer.

Examiner agrees with Applicant in that in the Office Action mailed on 23 July 2003 the Examiner inadvertently named conductive layer 228 a memory stack layer. However, the reference is used as a whole in the rejection and Examiner points out as reference also Figure 6 and related text.

33. Applicant contests that Jones fails to teach or suggest “removing at least a portion of the insulating material over at least one of the memory element stacks to expose the top conductive layer of the at least one memory element stack.

Examiner respectfully submits that Jones discloses the aforementioned limitation in (Column 6, Lines 15 – 23), the insulating material being, layer 244 and not 254.

34. Applicant contests that Jones fails to teach forming an insulating material over and in between the spaced apart magnetic memory stacks.

Examiner respectfully submits that layer 244 is over and between magnetic memory stacks.

35. Applicant contests that Jones does not teach the second magnetic layer having an associated top conductive layer.

Examiner respectfully submits that the second magnetic layer 236 has an associated top conductive layer 248.

36. All the numerals recited, in the section "Response to Arguments," are shown in Figure 6, which is the figure used in the previous Office Action and also in this Office Action.

Conclusion

37. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Art Unit: 2823

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando Toledo whose telephone number is 703-305-0567. The examiner can normally be reached on Mon-Fri 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


FToledo


George Fourson
Primary Examiner
Art Unit 2823